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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/718,602	SAITO, KAZUHIRO	
	Examiner	Art Unit	
	Lawrence E. Wills	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☒ Claim(s) *2,3,10 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/19/2004*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1- 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, lines 13-17 states that "on each of a line connecting two vertexes, of black and white on the solid, a line running on the surface of the solid and connecting a plurality of vertexes of the solid and a line running on the surface of the solid and connecting a plurality of the vertexes of the solid as well as the point of the special color". It is not clear if these are three separate lines or one line. In addition, a solid may have hundreds or no vertexes. It is unclear which plurality of vertexes are connected by the line. Lines 21-22 state "dividing the solid by the lines into a plurality of solids which include said line as a side dividing the solid by the lines into a plurality of solids which include said line as a side". It is unclear line is the "said line" or the line that is to divide the solid.

Regarding claim 2, lines 14-17 states that "executing the interpolation process on the plurality of divided solids based on the grid point data of the grid points on the lines to obtain grid point data for the grid points located on other than the lines." It is unclear what grid points

are "located on other than the lines". It is also unclear which lines are being referred to in “the grid points on the lines”.

Regarding claim 3, lines 24- 26 states that “the divided solid including the line containing the point of a secondary color of the special color and a color of the vertex”. It is unclear if the point of a secondary color is the color of the vertex or if theses are two separate points on a single line.

Regarding claim 9, lines 26 (page 52) -4 (page 53) states that “on each of a line connecting two vertexes, of black and white on the solid, a line running on the surface of the solid and connecting a plurality of vertexes of the solid and a line running on the surface of the solid and connecting a plurality of the vertexes of the solid as well as the point of the special color”. It is not clear if these are three separate lines or one line. In addition, a solid may have hundreds or no vertexes. It is unclear which plurality of vertexes are connected by the line. Lines 21-22 state “dividing the solid by the lines into a plurality of solids which include said line as a side dividing the solid by the lines into a plurality of solids which include said line as a side”. It is unclear line is the "said line" or the line that is to divide the solid.

Regarding claim 10, lines 26 (page 53) -3 (page 54) states that “executing the interpolation process on the plurality of divided solids based on the grid point data of the grid points on the lines to obtain grid point data for the grid points located on other than the lines.” It is unclear what grid points are "located on other than the lines". It is also unclear which lines are being referred to in “the grid points on the lines”.

Regarding claim 11, lines 8- 12 states that “the divided solid including the line containing the point of a secondary color of the special color and a color of the vertex”. It is unclear if the

point of a secondary color is the color of the vertex or if theses are two separate points on a single line.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 15 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 15 fails to fall within a statutory category of invention. It is directed to the program itself, not a process occurring as a result of executing the program, a machine programmed to operate in accordance with the program, or a manufacture structurally and functionally interconnected with the program in a manner which enables the program to act as a computer component and realize its functionality. It's also clearly not directed to a composition of matter. Therefore, claim 15 is non-statutory under 35 USC 101.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject

matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 6-9, 14, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hains (US Patent 6,724,500) in view of Mantell et al.(US Patent 6,307,645).

Regarding claim 1, Hains'500 teaches method of generating a color separation table that stores grid point data of printing material colors used in a printing apparatus correspondingly to grid points that are defined by predetermined input colors for converting the predetermined input colors to the printing material colors (the mapping between the two color spaces, column 3, lines 15-16), which include a special color (pink, sky-blue, and mint-green in column 6, lines 51-52; brown, teal, and plum in column 6, lines 55-56) other than colors corresponding to vertexes of a solid formed by the grid points (Fig. 6 shows mint, teal, and sky not on the vertices of the solid), said method comprising: table data generating step (generate printer gamot polyhedron in CIE L*a*b, Fig. 12 step 72) for, for the grid points on each of a line connecting two vertexes of black and white on the solid (neutral axis in column 6, lines 28-32 in addition Fig.8), a line running on the surface of the solid and connecting a plurality of vertexes of the solid (Fig. 8) and a line running on the surface of the solid and connecting a plurality of the vertexes of the solid as well as the point of the special color (Fig.8), obtaining the grid point data based on the color measurement of predetermined patches (test patches are then scanned by a colorimeter to generated CIEL*a*b coordinates, Fig. 12 step 70); and interpolation step for dividing the solid by the lines into a plurality of solids which include said line as a side (Fig. 8 shows the dividing of the solid by lines into many solids) and executing an interpolation process (Fig. 13, step 77)

on the plurality of divided solids based on the grid point data (obtaining color source to be printed, step 78,80) of the grid points on the lines to obtain grid point data for the grid points located on other than the lines in each of the divided solids (retrieving the tetrahedra stored, step 82, identifying a source-bearing tetrahedron that includes the source point, step 84, and finally identify target color, step 90, and send target color to printer, step 92).

Hains'500 fails to expressly teach a special color point setting step for setting a point of the special color on a side connecting two vertexes of the solid.

Mantell'645 teaches a special color point setting step for setting a point of the special color on a side connecting two vertexes of the solid (Fig. 1 shows special color point O, in addition, each hi-fi color can theoretically be simulated by combining colorants of the two adjacent primary colors, in column 1, lines 25-30)

Having a system of the Hains'500 reference and then given the well-established teaching of the Mantell'645 reference, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of the Hains'500 reference as taught by the Mantell'645 reference, since the Mantell'645 reference suggested solving the problem of transition through the color space from a first color hue to an opposing color hue (Mantell'645, column 5, line 5).

Regarding claim 6, the combination of Hains'500 and Mantell'645 teach wherein the printing material colors other than the special color are four colors of cyan, magenta, yellow and black or six colors of light cyan and light magenta (Mantell'645 dark cyan or light cyan, in

column 8, line 66) in addition to cyan, magenta, yellow, black (Mantell'645 CMYK in column 6, line 18).

Regarding claim 7, the combination of Hains'500 and Mantell'645 teach wherein the special color is a color of orange (Mantell'645 orange, column 8, line 61).

Regarding claim 8, the combination of Hains'500 and Mantell'645 teach wherein the predetermined input colors are colors of red, green and blue (Mantell'645 red, green, blue, column 9, line 11).

Regarding claim 9, Hains'500 teaches image processing apparatus (Fig. 2, number 17) for generating a color separation table that stores grid point data of printing material colors used in a printing apparatus correspondingly to grid points that are defined by predetermined input colors for converting the predetermined input colors to the printing material colors (the mapping between the two color spaces, column 3, lines 15-16), which include a special color (pink, sky-blue, and mint-green in column 6, lines 51-52; brown, teal, and plum in column 6, lines 55-56) other than colors corresponding to vertexes of a solid formed by the grid points (Fig. 6 shows mint, teal, and sky not on the vertices of the solid), said apparatus comprising: table data generating means (vertex mapper 48 column 6, line 22, in addition, number 48 in Fig. 2) for, for the grid points on each of a line connecting two vertexes of black and white on the solid (neutral axis in column 6, lines 28-32 in addition Fig.8), a line running on the surface of the solid and connecting a plurality of vertexes of the solid (Fig. 8) and a line running on the surface of the

solid and connecting a plurality of the vertexes of the solid as well as the point of the special color (Fig. 8), obtaining the grid point data based on the color measurement of predetermined patches (test patches are then scanned by a colorimeter to generated CIEL*a*b coordinates, Fig. 12 step 70); and interpolation means (source-gamut transformer 54, in Fig. 2) for dividing the solid by the lines into a plurality of solids which include said line as a side (Fig. 8 shows the dividing of the solid by lines into many solids) and executing an interpolation process (Fig. 13, step 77) on the plurality of divided solids based on the grid point data (obtaining color source to be printed, step 78,80) of the grid points on the lines to obtain grid point data for the grid points located on other than the lines in each of the divided solids (retrieving the tetrahedra stored, step 82, identifying a source-bearing tetrahedron that includes the source point, step 84, and finally identify target color, step 90, and send target color to printer, step 92).

Hains'500 fails to expressly teach a special color point setting means for setting a point of the special color on a side connecting two vertexes of the solid.

Mantell'645 teaches a special color point setting means for setting a point of the special color on a side connecting two vertexes of the solid (Fig. 1 shows special color point O, in addition, each hi-fi color can theoretically be simulated by combining colorants of the two adjacent primary colors, in column 1, lines 25-30)

Having a system of the Hains'500 reference and then given the well-established teaching of the Mantell'645 reference, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of the Hains'500 reference as taught by the Mantell'645 reference, since the Mantell'645 reference suggested solving the problem of

transition through the color space from a first color hue to an opposing color hue (Mantell'645, column 5, line 5).

Regarding claim 14, Hains'500 teaches an image processing apparatus (Fig. 2, number 17) for using a color separation table that stores grid point data of printing material colors used in a printing apparatus correspondingly to grid points that are defined by predetermined input colors for converting the predetermined input colors to the printing material colors(the mapping between the two color spaces, column 3, lines 15-16), which include a special color (pink, sky-blue, and mint-green in column 6, lines 51-52; brown, teal, and plum in column 6, lines 55-56) other than colors corresponding to vertexes of a solid formed by the grid points (Fig. 6 shows mint, teal, and sky not on the vertices of the solid), said apparatus comprising: table data generating means (vertex mapper 48 column 6, line 22, in addition, number 48 in Fig. 2) for, for the grid points on each of a line connecting two vertexes of black and white on the solid (neutral axis in column 6, lines 28-32 in addition Fig.8), a line running on the surface of the solid and connecting a plurality of vertexes of the solid (Fig. 8) and a line running on the surface of the solid and connecting a plurality of the vertexes of the solid as well as the point of the special color (Fig. 8), obtaining the grid point data based on the color measurement of predetermined patches (test patches are then scanned by a colorimeter to generated CIEL*a*b coordinates, Fig. 12 step 70); and interpolation means (source-gamut transformer 54, in Fig. 2) for dividing the solid by the lines into a plurality of solids which include said line as a side (Fig. 8 shows the dividing of the solid by lines into many solids) and executing an interpolation process (Fig. 13, step 77) on the plurality of divided solids based on the grid point data (obtaining color source to

be printed, step 78,80) of the grid points on the lines to obtain grid point data for the grid points located on other than the lines in each of the divided solids (retrieving the tetrahedra stored, step 82, identifying a source-bearing tetrahedron that includes the source point, step 84, and finally identify target color, step 90, and send target color to printer, step 92).

Hains'500 fails to expressly teach a special color point setting means for setting a point of the special color on a side connecting two vertexes of the solid.

Mantell'645 teaches a special color point setting means for setting a point of the special color on a side connecting two vertexes of the solid (Fig. 1 shows special color point O, in addition, each hi-fi color can theoretically be simulated by combining colorants of the two adjacent primary colors, in column 1, lines 25-30)

Having a system of the Hains'500 reference and then given the well-established teaching of the Mantell'645 reference, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of the Hains'500 reference as taught by the Mantell'645 reference, since the Mantell'645 reference suggested solving the problem of transition through the color space from a first color hue to an opposing color hue (Mantell'645, column 5, line 5).

Regarding claim 15, Hains'500 teaches a program that is read by a computer to execute a process (color-correction system is loaded into a volatile memory element, in column 5, line 27) of generating a color separation table that stores grid point data of printing material colors used in a printing apparatus correspondingly to grid points that are defined by predetermined input colors for converting the predetermined input colors to the printing material colors (the mapping

between the two color spaces, column 3, lines 15-16), which include a special color (pink, sky-blue, and mint-green in column 6, lines 51-52; brown, teal, and plum in column 6, lines 55-56)other than colors corresponding to vertexes of a solid formed by the grid points (Fig. 6 shows mint, teal, and sky not on the vertices of the solid), said method comprising: table data generating step (generate printer gamot polyhedron in CIE L*a*b, Fig. 12 step 72) for, for the grid points on each of a line connecting two vertexes of black and white on the solid (neutral axis in column 6, lines 28-32 in addition Fig.8), a line running on the surface of the solid and connecting a plurality of vertexes of the solid (Fig. 8) and a line running on the surface of the solid and connecting a plurality of the vertexes of the solid as well as the point of the special color (Fig.8), obtaining the grid point data based on the color measurement of predetermined patches (test patches are then scanned by a colorimeter to generated CIEL*a*b coordinates, Fig. 12 step 70); and interpolation step for dividing the solid by the lines into a plurality of solids which include said line as a side (Fig. 8 shows the dividing of the solid by lines into many solids) and executing an interpolation process (Fig. 13, step 77) on the plurality of divided solids based on the grid point data (obtaining color source to be printed, step 78,80) of the grid points on the lines to obtain grid point data for the grid points located on other than the lines in each of the divided solids (retrieving the tetrahedra stored, step 82, identifying a source-bearing tetrahedron that includes the source point, step 84, and finally identify target color, step 90, and send target color to printer, step 92).

Hains'500 fails to expressly teach a special color point setting step for setting a point of the special color on a side connecting two vertexes of the solid.

Mantell'645 teaches a special color point setting step for setting a point of the special color on a side connecting two vertexes of the solid (Fig. 1 shows special color point O, in addition, each hi-fi color can theoretically be simulated by combining colorants of the two adjacent primary colors, in column 1, lines 25-30).

Having a system of the Hains'500 reference and then given the well-established teaching of the Mantell'645 reference, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of the Hains'500 reference as taught by the Mantell'645 reference, since the Mantell'645 reference suggested solving the problem of transition through the color space from a first color hue to an opposing color hue (Mantell'645, column 5, line 5).

Regarding claim 16, Hains'500 teaches a storage medium that stores a program readably by a computer, the program being used for executing a process (color-correction system is loaded into a volatile memory element, in column 5, line 27) of generating a color separation table that stores grid point data of printing material colors used in a printing apparatus correspondingly to grid points that are defined by predetermined input colors for converting the predetermined input colors to the printing material colors (the mapping between the two color spaces, column 3, lines 15-16), which include a special color (pink, sky-blue, and mint-green in column 6, lines 51-52; brown, teal, and plum in column 6, lines 55-56)other than colors corresponding to vertexes of a solid formed by the grid points (Fig. 6 shows mint, teal, and sky not on the vertices of the solid), said method comprising: table data generating step (generate printer gamot polyhedron in CIE L*a*b, Fig. 12 step 72) for, for the grid points on each of a line

connecting two vertexes of black and white on the solid (neutral axis in column 6, lines 28-32 in addition Fig.8), a line running on the surface of the solid and connecting a plurality of vertexes of the solid (Fig. 8) and a line running on the surface of the solid and connecting a plurality of the vertexes of the solid as well as the point of the special color (Fig.8), obtaining the grid point data based on the color measurement of predetermined patches (test patches are then scanned by a colorimeter to generated CIEL*a*b coordinates, Fig. 12 step 70); and interpolation step for dividing the solid by the lines into a plurality of solids which include said line as a side (Fig. 8 shows the dividing of the solid by lines into many solids) and executing an interpolation process (Fig. 13, step 77) on the plurality of divided solids based on the grid point data (obtaining color source to be printed, step 78,80) of the grid points on the lines to obtain grid point data for the grid points located on other than the lines in each of the divided solids (retrieving the tetrahedra stored, step 82, identifying a source-bearing tetrahedron that includes the source point, step 84, and finally identify target color, step 90, and send target color to printer, step 92).

Hains'500 fails to expressly teach a special color point setting step for setting a point of the special color on a side connecting two vertexes of the solid.

Mantell'645 teaches a special color point setting step for setting a point of the special color on a side connecting two vertexes of the solid (Fig. 1 shows special color point O, in addition, each hi-fi color can theoretically be simulated by combining colorants of the two adjacent primary colors, in column 1, lines 25-30)

Having a system of the Hains'500 reference and then given the well-established teaching of the Mantell'645 reference, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of the Hains'500 reference as taught

by the Mantell'645 reference, since the Mantell'645 reference suggested solving the problem of transition through the color space from a first color hue to an opposing color hue (Mantell'645, column 5, line 5).

3. Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mantell'645 and Hains'500 as applied to claims 1 and 9 above, and further in view of Deutsch et al. (Patent No. 5,187,594)

Regarding claim 4, the combination of Hains'500 and Mantell'645 fails to disclosed the limitation of wherein each of the divided solids is a tetrahedron and the interpolation process is executed such that the tetrahedron is divided into a plurality of triangles and the interpolation is executed on each of the divided triangles based on the grid point data of the grid points on three sides of said each triangle to obtain the grid point data located on the surface of said each triangle the source image pixel values are first arranged into small groups to form the vertices of a set of closed polygons.

Deutsch'549 teaches each of the divided solids is a tetrahedron and the interpolation process is executed such that the tetrahedron is divided into a plurality of triangles (the source image pixel values are first arranged into small groups to form the vertices of a set of closed polygons, column 13, line 45) and the interpolation is executed on each of the divided triangles based on the grid point data of the grid points on three sides of said each triangle to obtain the grid point data located on the surface of said each triangle. (The preferred group size is three, so that the closed polygons are triangles 256. Each such triangle 256 thus defines a planar surface

in continuous space which is mapped into the coordinate system of the output device 115. The interpolated pixel values 258 along the sides of each triangle are then determined using a Brezenham algorithm, or similar known technique for determining which pixels lie along the sides of a closed polygon, as shown in FIG. 14B, column 13, lines 47-55)

Having a system of Mantell'645 and Hains'500 references and then given the well-established teaching of Deutsch'549 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Mantell'645 and Hains'500 reference as taught by Deutsch'549 reference, since Deutsch'549 reference suggested producing a much higher quality image (column 3, line 66).

Regarding claim 12, the combination of Hains'500 and Mantell'645 fails to disclosed the limitation of wherein each of the divided solids is a tetrahedron and the interpolation process is executed such that the tetrahedron is divided into a plurality of triangles and the interpolation is executed on each of the divided triangles based on the grid point data of the grid points on three sides of said each triangle to obtain the grid point data located on the surface of said each triangle.

Deutsch'549 teaches each of the divided solids is a tetrahedron and the interpolation process is executed such that the tetrahedron is divided into a plurality of triangles (the source image pixel values are first arranged into small groups to form the vertices of a set of closed polygons, column 13, line 45) and the interpolation is executed on each of the divided triangles based on the grid point data of the grid points on three sides of said each triangle to obtain the grid point data located on the surface of said each triangle. (The preferred group size is three, so that the closed polygons are triangles 256. Each such triangle 256 thus defines a planar surface

in continuous space which is mapped into the coordinate system of the output device 115. The interpolated pixel values 258 along the sides of each triangle are then determined using a Brezenham algorithm, or similar known technique for determining which pixels lie along the sides of a closed polygon, as shown in FIG. 14B, column 13, lines 47-55)

Having a system of Mantell'645 and Hains'500 references and then given the well-established teaching of Deutsch'549 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Mantell'645 and Hains'500 reference as taught by Deutsch'549 reference, since Deutsch'549 reference suggested producing a much higher quality image (column 3, line 66)

4. Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mantell'645, Deutsch'594 and Hains'500 as applied to claims 4 and 12 above, and further in view of Franklin (Patent No. 4,334,240)

Regarding claim 5, the combination of Hains'500, Mantell'645, and Deutsch'549 fails to disclosed the limitation of wherein the interpolation process based on the grid point data of the grid points on three sides of the triangle is a process based on the grid point data on the two sides of three sides, or a process using a finite element method based on the grid point data on any of one side, two sides or three sides of three sides.

Franklin teaches the interpolation process based on the grid point data of the grid points on three sides of the triangle is a process based on the grid point data on the two sides of three sides, or a process using a finite element method based on the grid point data on any of one side,

two sides or three sides of three sides. (In the case of a rectangle, it has been proposed to subdivide the unit rectangle into triangles. Interpolation within triangles has been discussed, for example by R. H. Gallagher in "Finite Element Analysis Fundamentals", published by Prentice-Hall, New Jersey, 1975. In this publication, the author first discusses interpolation procedures for triangular elements and derives co-ordinate values for a point within the triangle, each co-ordinate value being the sum of three products, each product involving the rectangular co-ordinates of a respective corner of the triangle and the ratio of the area of a smaller triangle, defined by the other two corners and the point within the triangle, to the area of the triangle as a whole. Thereafter, the use of the tetrahedron, the three-dimensional counterpart of the planar triangle, is discussed and volume ratios are derived to replace the area ratios used in the case of the triangle. Column 3, lines 51-67)

Having a system of Mantell'645, Hains'500, and Deutsch'549 references and then given the well-established teaching of Franklin'240 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Mantell'645, Hains'500, and Deutsch'549 reference as taught by Franklin'240 reference, since Franklin'240 reference suggested achieving greater accuracy (column 1, line 5).

Regarding claim 13, the combination of Mantell'645, Hains'500, and Deutsch'549 fails to disclosed the limitation of wherein the interpolation process based on the grid point data of the grid points on three sides of the triangle is a process based on the grid point data on the two sides of three sides, or a process using a finite element method based on the grid point data on any of one side, two sides or three sides of three sides.

Franklin teaches the interpolation process based on the grid point data of the grid points on three sides of the triangle is a process based on the grid point data on the two sides of three sides, or a process using a finite element method based on the grid point data on any of one side, two sides or three sides of three sides. (In the case of a rectangle, it has been proposed to sub-divide the unit rectangle into triangles. Interpolation within triangles has been discussed, for example by R. H. Gallagher in "Finite Element Analysis Fundamentals", published by Prentice-Hall, New Jersey, 1975. In this publication, the author first discusses interpolation procedures for triangular elements and derives co-ordinate values for a point within the triangle, each co-ordinate value being the sum of three products, each product involving the rectangular co-ordinates of a respective corner of the triangle and the ratio of the area of a smaller triangle, defined by the other two corners and the point within the triangle, to the area of the triangle as a whole. Thereafter, the use of the tetrahedron, the three-dimensional counterpart of the planar triangle, is discussed and volume ratios are derived to replace the area ratios used in the case of the triangle. Column 3, lines 51-67)

Having a system of Mantell'645, Hains'500, and Deutsch'549 references and then given the well-established teaching of Franklin'240 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Mantell'645, Hains'500, and Deutsch'549 reference as taught by Franklin'240 reference, since Franklin'240 reference suggested achieving greater accuracy (column 1, line 5).

Allowable Subject Matter

5. Claims 2, 3, 10 and 11 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Regarding claim 2, the combination of Hains'500 and Mantell'645 fails to disclosed the limitation of further comprising step for setting a point of secondary color of the special color on one of two vertexes of the side on which the special color is set, and executing the interpolation process on the plurality of divided solids based on the grid point data of the grid points on the lines to obtain grid point data for the grid points located on other than the lines.

Regarding claim 3, the combination of Hains'500 and Mantell'645 fails to disclosed the limitation of executes a enlargement process, executes the interpolation process on the enlarged solid, executes a reduction process in which the coordinate of the point of the special color, and obtains the grid point data of the grid points on the original divided solid based on the grid points and grid point data obtained by the interpolation on the enlarged solid.

Regarding claim 10, the combination of Hains'500 and Mantell'645 fails to disclosed the limitation of further comprising step for setting a point of secondary color of the special color on one of two vertexes of the side on which the special color is set, and executing the interpolation process on the plurality of divided solids based on the grid point data of the grid points on the lines to obtain grid point data for the grid points located on other than the lines.

Regarding claim 11, the combination of Hains'500 and Mantell'645 fails to disclosed the limitation of executes a enlargement process, executes the interpolation process on the enlarged solid, executes a reduction process in which the coordinate of the point of the special color, and

obtains the grid point data of the grid points on the original divided solid based on the grid points and grid point data obtained by the interpolation on the enlarged solid.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence E. Wills whose telephone number is 571-270-3145. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Aung Moe can be reached on 571-272-7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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LEW

December 7, 2007

AUNG S. MOE
SUPERVISORY PATENT EXAMINER
12/18/07